

Amendments to the Specification

Please replace the paragraph [0051] beginning at page 32, with the following rewritten paragraph

[0051]

[Math 5]

$$\begin{pmatrix} X_{PIV} \\ Y_{PIV} \\ Z_{PIV} \end{pmatrix} = \begin{pmatrix} R_{00} & R_{01} & R_{02} \\ R_{10} & R_{11} & R_{12} \\ R_{20} & R_{21} & R_{22} \end{pmatrix} \begin{pmatrix} M_{00} & M_{01} & M_{02} \\ M_{10} & M_{11} & M_{12} \\ M_{20} & M_{21} & M_{22} \end{pmatrix} \begin{pmatrix} X_{PC} \\ Y_{PC} \\ Z_{PC} \end{pmatrix} + \begin{pmatrix} X_{TW} \\ Y_{TW} \\ Z_{TW} \end{pmatrix} + \begin{pmatrix} \Delta X_{TW} \\ \Delta Y_{TW} \\ \Delta Z_{TW} \end{pmatrix}$$

... (Formula 5)

The 3x3 matrix value having elements M_{00} to M_{22} and (X_{TW}, Y_{TW}, Z_{TW}) can be calculated by placing the camera 5303 at the orientation reference and at the positional reference or by conducting the calibration referred to in Non-Patent Reference 1 below using the current orientation and position of the camera 5303 as the orientation reference and the positional reference, respectively. These values are calculated before the imaging zone adjusting apparatus of the present invention starts operating. Non-Patent Reference 1: A Versatile Camera Calibration Technique for High-Accuracy 3D Machine Vision Metrology Using Off-the-Shelf TV Cameras and Lenses. IEEE journal of Robotics and Automation, Vol. RA-3, No. 4, pp. 323-344, 1987. The 3x3 matrix value having elements R_{00} to R_{22} presenting the orientation shift of the camera 5303 from the orientation reference can be calculated as presented by the expression 6 using rotation angles $(\Theta_P, \Theta_T, \Theta_R) - (\Theta_P, \Theta_T, \Theta_R)$ that reflect the orientation of the camera 5303. The rotation angles $(\Theta_P, \Theta_T, \Theta_R) - (\Theta_P, \Theta_T, \Theta_R)$ or the orientation of the camera 5303 and the positional shift $(\Delta X_{TW}, \Delta Y_{TW}, \Delta Z_{TW}) - (\Delta X_{TW}, \Delta Y_{TW}, \Delta Z_{TW})$ of the camera 5303 from the positional reference can be obtained by reading the shift in the stepping motor where the position of the camera 5303 is changed by a stepping motor.